

9/6/01

1 of 1

Supersedes 6/8/2000

**S U P P L E M E N T A L   S P E C I F I C A T I O N****AMENDMENT TO SECTION 604 -- CATCH BASINS, DROP INLETS, AND  
MANHOLES****Amend** 2.3 to read:

**2.3** Precast concrete sections shall conform to AASHTO M 199M (AASHTO M 199). The concrete shall be Class AA, meeting the requirements of 520 except as noted herein.

**Add** to 2.3:

**2.3.1** Except for components cast using the dry cast process, Precast concrete components shall not have the forms removed until a minimum compressive strength of 15 Mpa (2000 psi) has been achieved. Once initial set of the concrete has occurred, precast components shall not be moved until a minimum compressive strength of 15Mpa (2000 psi) has been achieved. Concrete cylinders shall be made, in accordance with AASHTO T 23, at the last placement of the day.

**2.3.2 Curing of precast sections.**

**2.3.2.1** All precast concrete units shall be coated with a white pigmented curing compound before being stored outside. The membrane curing compounds used under this method shall be Type 2 (white pigmented) Class B conforming to AASHTO M 148 and must appear on the Department's current Approved Products List. The compound shall be properly agitated immediately before each use. A minimum coverage rate of two liters per 10 square meters (1 gallon per 200 square feet) shall be used.

**2.3.2.1.1** Where concrete is to be bonded with fresh concrete or coatings applied, curing compound shall be removed.

**2.3.2.2** Prior to placement of the curing compound, all precast concrete units shall be subjected to curing by any one of the methods described below. The manufacturer shall provide minimum/maximum temperature thermometers to monitor curing temperatures unless otherwise specified. If, at any time, curing temperatures fall below the specified minimum for the chosen curing method, the curing period shall be increased accordingly. No unit shall be subjected to freezing temperatures until eighty percent of the specified 28 day compressive strength has been reached.

**2.3.2.3** Units which are exposed to freezing before reaching the required 28 day compressive strength may require additional testing for compressive strength, as directed by the Materials and Research Bureau. Additional testing, when required, will be performed on cores taken from the hardened concrete.

**2.3.2.4 Steam Curing.** The units shall be cured in a suitable enclosure as approved by the Bureau of Materials and Research. The enclosure shall be designed to minimize the loss of heat and moisture while allowing for the uniform circulation of steam around the entire unit. The interior surfaces of the enclosure and the surface of the unit shall be moist at all times. Steps shall be taken to prevent localized “hot spots” caused by the steam lines. The enclosure shall be free from outside drafts.

**2.3.2.4.1** Steam curing shall not begin until a preset period has been completed. The preset period begins when the last concrete has been placed and continues until the concrete obtains initial set. Prior written approval from the Bureau of Materials and Research is required when preset periods of less than two hours are to be used.

**2.3.2.4.2** During the preset period, moderate heat may be applied to the enclosure to maintain the initial temperature of the concrete. The maximum temperature inside the enclosure during the preset period shall be the initial temperature of the concrete, plus 5 degrees C (9° F).

**2.3.2.4.3** After the preset period is complete, steam shall be injected into the curing enclosure. The temperature inside the enclosure shall not be increased at a rate greater than 20 degrees C (36° F) per hour. A moist atmosphere will be maintained at a temperature between 40 degrees C (104° F) and 85 degrees C (185° F) for a period of not less than 12 hours. The temperature inside the enclosure shall then be decreased at a rate not exceeding 20 degrees C (36° F) per hour until the ambient temperature outside the enclosure is reached. The manufacturer shall provide automatic temperature recorders to continuously record the curing temperature inside the enclosure. The concrete strength shall be determined by testing cylinders cured in the same environment as the concrete they represent.

**2.3.2.5 Water Spray Curing.** Curing shall begin as soon as the concrete has hardened sufficiently to prevent surface damage from the water spray. All exposed surfaces of the precast unit shall be kept wet with a continuous fine spray of water in an enclosure maintained at a temperature of not less than 20 degrees C (68° F) for 72 hours or until 80% of the 28 day compressive strength is reached. The concrete strength shall be determined by testing cylinders cured using the water spray method and kept in the same environment as the concrete they represent.

**2.3.2.6 Saturated Cover Curing.** The saturated covers used under this method shall be burlap, meeting the requirements of 520.2.6.1. Curing shall begin as soon as the concrete has hardened sufficiently to prevent surface damage from the saturated burlap. All exposed concrete surfaces on the precast unit shall be covered with burlap, saturated with water before applying. The burlap will be kept saturated and the units kept at a temperature of not less than 20 degrees C (68° F) for 72 hours or until 80% of the 28 day compressive strength is reached. The concrete strength shall be determined by testing cylinders cured using the saturated cover method and kept in the same environment as the concrete they represent. Additional curing time may be necessary to meet the strength requirements.

**2.3.2.7 Moisture Retention Curing.** Units cured in accordance with these methods shall be maintained at a minimum temperature of 10 degrees C (50° F) for 7 days or until 80% of the

28 day compressive strength has been reached. Additional curing time may be necessary to meet the strength requirements. The concrete strength shall be determined by testing cylinders cured in the same environment as the concrete they represent. Moisture retention curing shall be accomplished by either of the following 2 methods.

#### **2.3.2.7.1 Membrane Curing Compound.**

**2.3.2.7.1.1** The membrane curing compound shall be applied to the concrete surface after finishing, as soon as the free water on the surface has disappeared and no water sheen is visible, but not so late that the liquid curing compound will be absorbed into the concrete. When curing compound cannot be applied within the above requirements, the manufacturer shall instead immediately begin curing the unit in accordance with one of the other curing methods contained in this specification, until curing compound can be applied. When curing compound is to be used in conjunction with any other method of cure, the Engineer shall be notified prior to the start of production. When this method is used in conjunction with the dry cast process, the curing room shall be kept at 100% humidity until a minimum compressive strength of 15 Mpa (2000 psi) has been obtained.

**2.3.2.7.1.2** When the forms are removed prior to 7 days, the exposed concrete surfaces shall be wet with water within one half hour of form removal and shall be kept wet until the curing compound is applied. Before application, the concrete shall be allowed to reach a uniformly damp appearance with no free water on the surface, and then the compound shall be applied immediately.

**2.3.2.7.1.3** This method of curing shall not be used on any concrete surface that is to have plastic concrete bonded to it. Another approved method of curing shall be used when this condition exists.

#### **2.3.2.7.2 Curing Covers.**

**2.3.2.7.2.1** The curing covers used under this method shall conform to AASHTO M 171. Curing covers shall be placed immediately following the finishing operation or form removal, whichever is applicable. Care shall be taken not to damage any exposed concrete surfaces during cover placement. Curing covers shall be placed and secured and be of such condition as to minimize the loss of moisture and temperature. When it is necessary to use more than one curing cover, the edges shall be lapped a minimum of 300 mm (12-inches).

**Amend** 2.7 to read:

**2.7** Castings shall be gray iron conforming to AASHTO M 105 and AASHTO M 306. Castings shall be proof load tested.

**Amend** 2.9 to read:

**2.9** Prefabricated adjustment rings for catch basins, drop inlets and manholes shall conform with 2.7 or as shown on the Approved Products List.

**Amend** 2.10 to read:

**2.10** Blank.

**Add** to 3.1:

**3.1.1** Reinforced precast sections shall not be shipped from the manufacturing facility until the eighth day from the date of manufacture, except when the supplier provides test results demonstrating that the design strength has been achieved.

**Add** to 3.3.1:

Adjustment rings shall be installed in accordance with the manufacturers recommendations.